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## **Port Enhancement Analysis**

### **Phase I:**

### **Port Workload Requirements for the CONUS Ammunition Ports**



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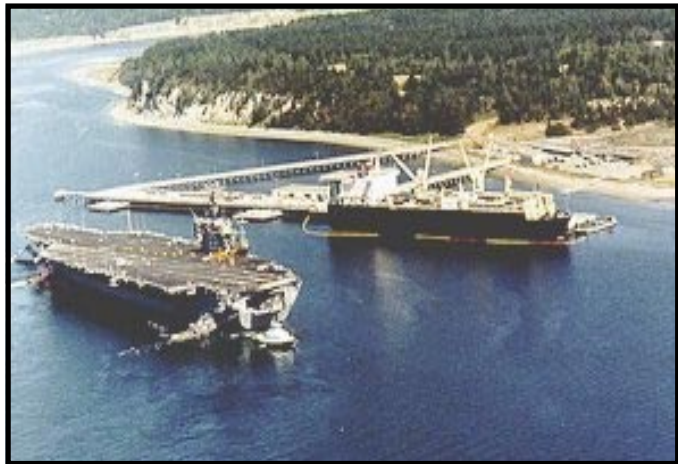
## INTRODUCTION

This is Phase I of a two-phased study.

- ◆ Phase I identifies the quantity of cargo DOD plans to send through the strategic seaport, and
- ◆ Phase II considers the ports' ability to handle their assigned workload.

The Military Traffic Management Command's Transportation Engineering Agency (TEA) has analyzed ports for years. With our Ports for National Defense Program, we survey the ports that are important to national defense, defining their capabilities. We then compare these capabilities to the demand imposed by a notional unit deploying through the port. Based on this comparison, we assess the port's ability to meet its requirements. This methodology has suited us well in the past. However, as the deployment windows continue to shrink, we are forced to get our CONUS-based forces through the ports faster than ever before. Compound this with the continued economic expansion in many of these areas, and it is becoming a challenge for the ports to dedicate the real estate and facilities to respond to our requirements.

As a result, TEA realized the need for a more precise assessment of each port's ability to meet its requirements. We realized the need to base each port's requirements on the most demanding operation plan (OPLAN) for that port. Using our modeling capability, we can work with the tremendous quantity of information in an OPLAN time-phased force deployment data (TPFDD), massage the data, and extract the detail needed to get an accurate picture of the deployment through each port.



## OBJECTIVES

The objectives of this initiative are:

### Phase I:

- (1) Define the OPLAN-based time-phased flow of cargo through the port during a demanding deployment. This flow is defined in terms of quantity and square feet.
- (2) Allow planners to assign Transportation Terminal Brigades/Battalions (TTBs) to ports based on workload.
- (3) Allow TTBs to adequately prepare for deployment operations.
- (4) Validate the need for deploying units to support Sea Ports of Embarkation (SPOEs).

### Phase II:

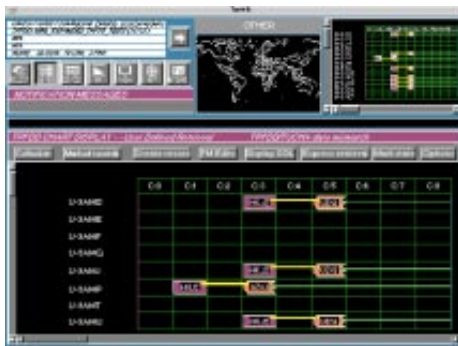
- (1) Assist the port commander in quantifying real estate and facility support needed from the port.
- (2) In instances where the port cannot meet their requirements, provide the quantitative basis to help both DOD and commercial planners assess potential “fixes.” These fixes could include:
  - Re-routing cargo to another port in the region,
  - Re-timing the flow, or even
  - Working through the local and metropolitan planning organizations to solicit federal funds.

## METHODOLOGY

When practical, ports are analyzed on a regional basis, allowing planners to examine an entire region at one time, evaluating peaks and valleys at groups of neighboring ports. Although they are not located in the same geographical region, the three ammunition ports were grouped together because of the uniqueness of their mission. In addition, the same TPFDD was not used for the three ports.

The following tools are utilized to analyze port workload:

**TPEDIT (TPFDD Editor)** – An integrated set of automated processing tools that provides time-phased force deployment data (TPFDD) editing and analysis capability. TPEDIT allows the analyst to:



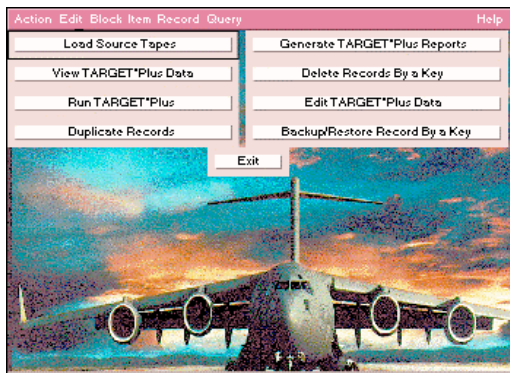
- ◆ View the TPFDD graphically.
- ◆ Extract information for the seaport of embarkation (SPOE) of interest.
- ◆ Edit the TPFDD. Remove “on-call” and “shortfalled” records.
- ◆ Review data to determine the amount of cargo (number of ULNs/CINs, quantity, square feet, short tons, measurement tons) flowing through the port.

**EXPANDED TPFDD** - A database shared by the simulation models and used for tracking movement requirements at the individual item level of detail. Using the expanded TPFDD the analyst can:

- ◆ Load the TPFDD into the Oracle database management system.
- ◆ “Expand” the TPFDD cargo detail within Oracle to Level 6 for the SPOE of interest.







**TARGET (Transportability Analysis Reports Generator)** – A system of models and programs that provide the capability to generate movement requirements at the individual item level of detail (Level 6). The system merges force structure data from the Table of Organization and Equipment (TOE) or the Modified TOE (MTOE) with equipment characteristics from the Department of the Army Standard Equipment Characteristic File (ECF) to create unit equipment tables. With TARGET, the analyst:

- ◆ Assigns transport modes by ULN/CIN (convoy/rail).
- ◆ Selects transport assets.

Containers (20' and 40')

Railcars (89' flatcars, 60' flatcars, 68' DODX railcars)

- ◆ Determines convoy, rail, and container requirements.

**FPM REPORTS** – A set of customized reports extracts detailed cargo information from TARGET output files. These reports, when imported into Microsoft Excel, are the foundation of the port workload effort. The graphs are included in the results section of this report.

## ASSUMPTIONS

- ◆ The requirements in this report represent:
  - The entire duration of the flow through the port, as defined by the OPLAN.
  - All records in the plan scheduled to move by sea under Military Sealift Command's (MSC) control.
  - The most demanding plan for each port. As a result, the same OPLAN was not used for all three ammunition ports. The plans may not necessarily be representative of the flow during an actual deployment.
- ◆ TPFDD Records not included in this analysis:
  - “On-call” records. These records are in the plan but are not scheduled to move – they appear with an available to load date (ALD) of 999.
  - “Shortfalled” records. These records are in the plan but are not sourced – they have not been matched with a specific unit.
  - POL records.
- ◆ TARGET uses the following transport assets:
  - Containers (20-foot, 40-foot)
  - Railcars (89-foot flatcars)

NOTE: Commercial Motor was not utilized
- ◆ Containers are stuffed at their origin.
- ◆ TARGET stuffs containers and loads railcars with unit integrity. This provides a conservative estimate of containers and railcars for each unit.
- ◆ Cargo coded in the TPFDD as containerizable with dimensions exceeding the allowable dimensions of a 20-foot container are categorized as “Container Outsize” cargo.



## RESULTS

The charts in this report represent the daily cargo arrival in terms of quantity and square feet at the respective port. The cargo for these three ports consists entirely of container eligible ammunition, general container eligible cargo, and container outsize cargo.

### PORT HADLOCK NAVAL ORDNANCE CENTER

The graphs below represent the cargo arriving at Port Hadlock Naval Ordnance Center as outlined in the TPFDD. Cargo arrives at the port starting on day 3 and continuing through day 158.

All cargo scheduled to arrive at Port Hadlock Naval Ordnance Center is assumed to arrive by rail. The railcars will arrive at the Naval Submarine Base (SUBASE) Bangor Container Transfer Facility, south of Port Hadlock. At the facility, containers will be transferred to a chassis and transported to Port Hadlock.

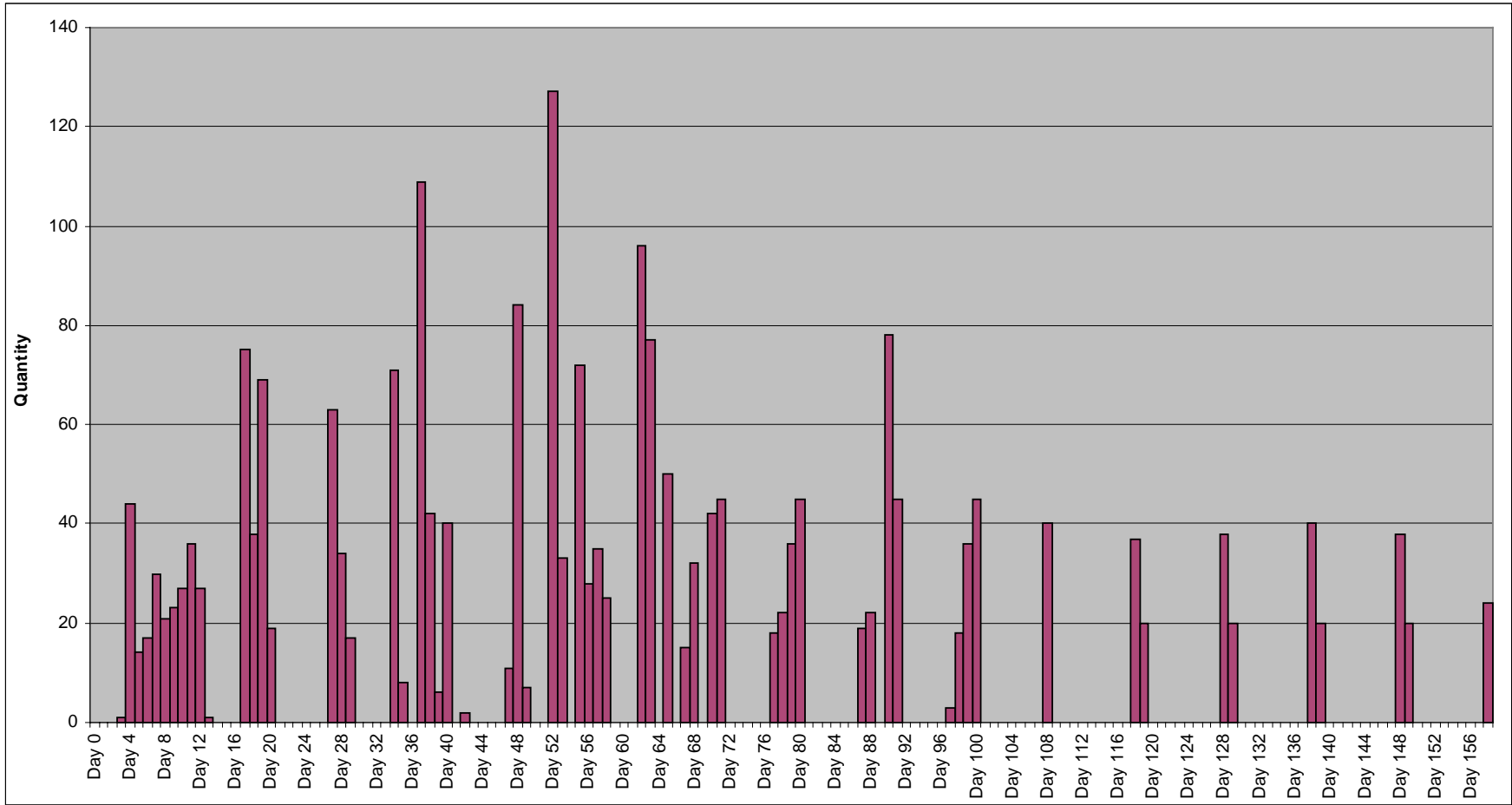
Port Hadlock has two categories of cargo scheduled to arrive in the TPFDD:

- 20-Foot Container Eligible Ammunition
- Container Outsize Cargo

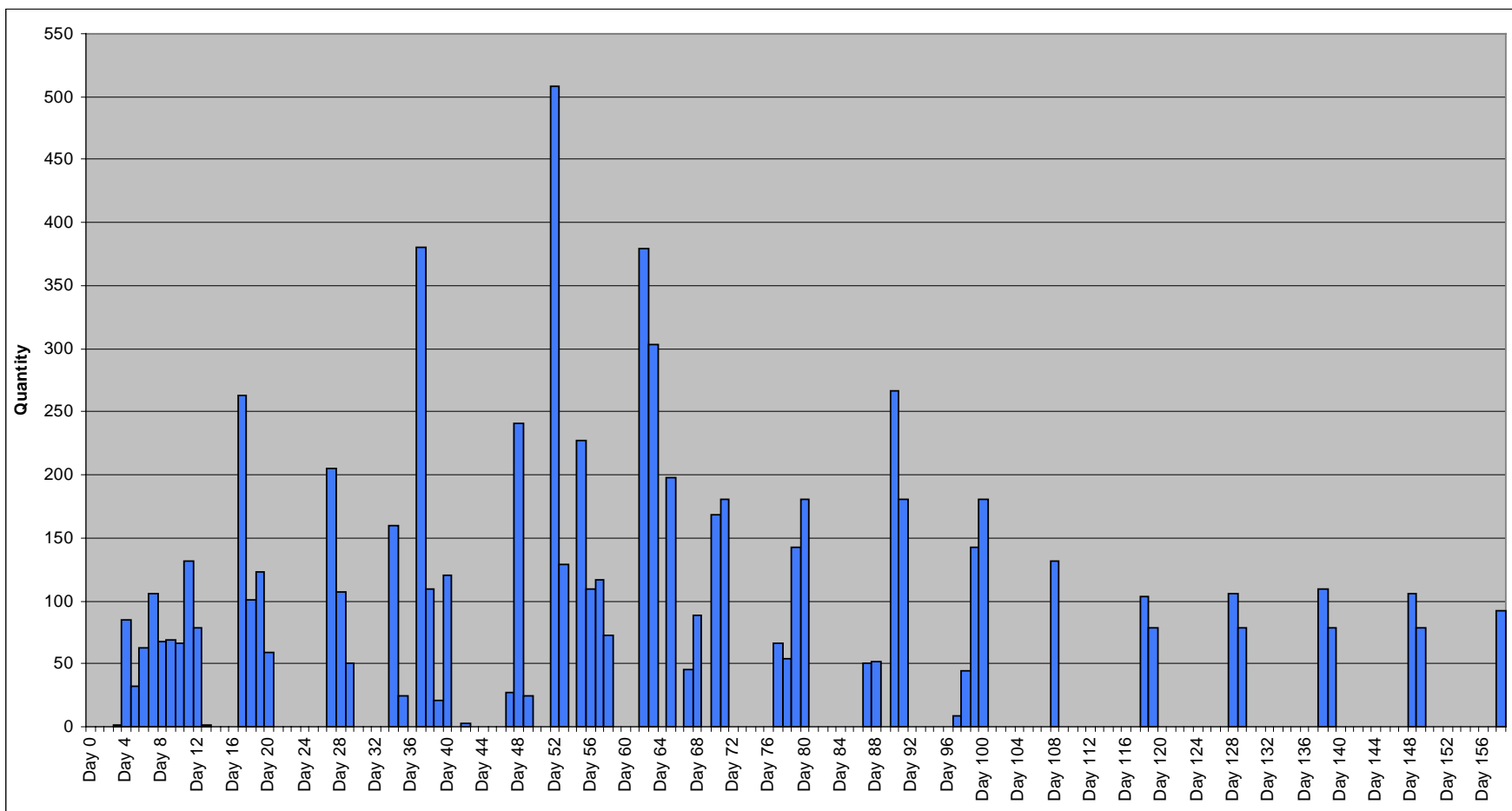
Figure 1 is the number of 89-foot railcars arriving at Port Hadlock by day.

Figure 2 displays the quantity of 20-foot containers arriving at Port Hadlock.

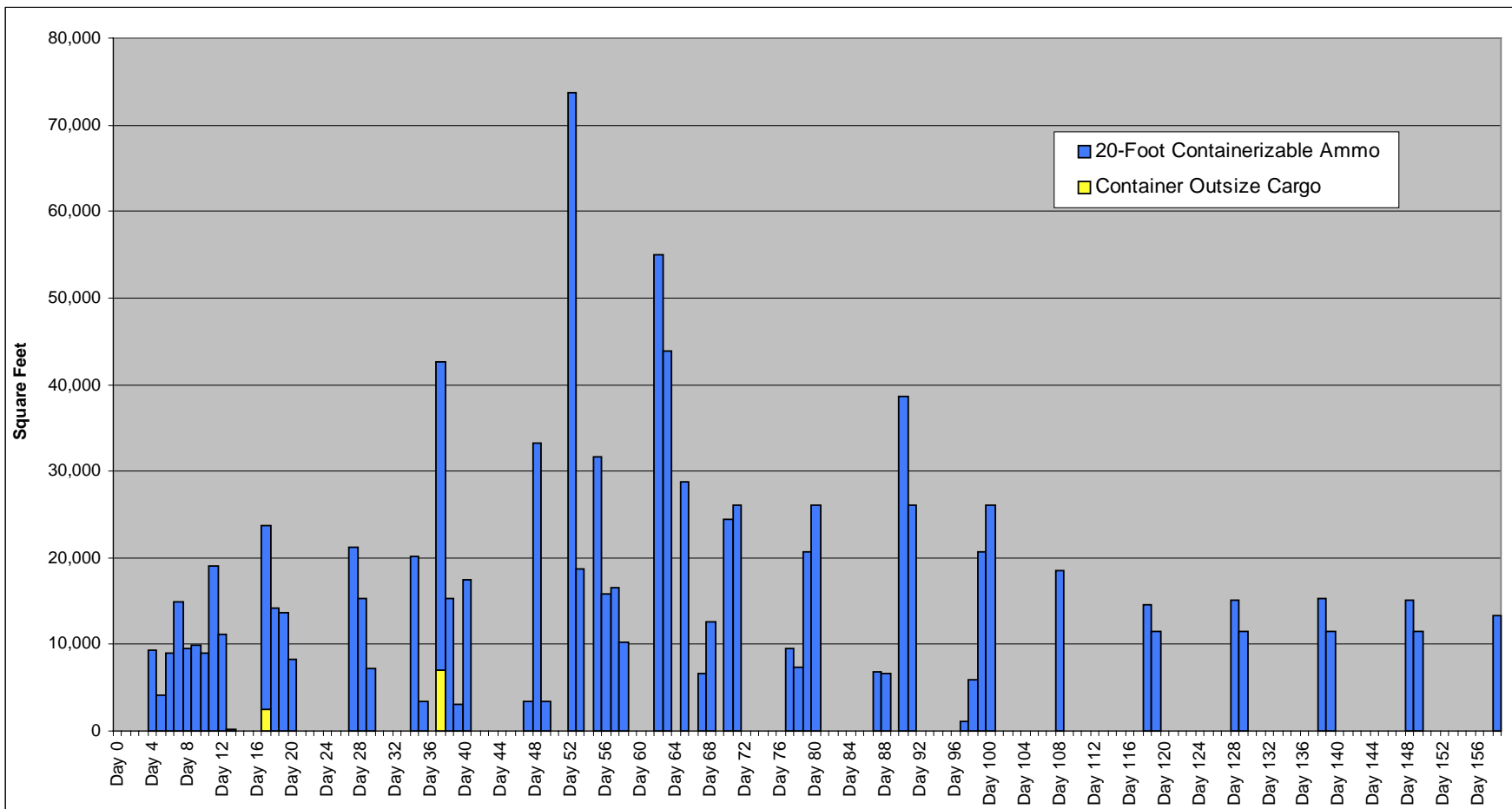
Figure 3 shows how much of the cargo arriving at Port Hadlock is containerizable ammunition and how much is too large for 20-foot containers (container outsize).



**Figure 1. Quantity of 89-Foot Railcars Arriving at Port Hadlock.**



*Figure 2. Quantity of 20-Foot Containers Arriving at Port Hadlock.*



**Figure 3. Total Square Feet of Cargo Arriving at Port Hadlock.**

## **NAVAL WEAPONS STATION CONCORD**

The graphs below represent the cargo arriving at the Naval Weapons Station Concord as outlined in the TPFDD. Cargo arrives at the port starting on day 2 and continuing through day 147.

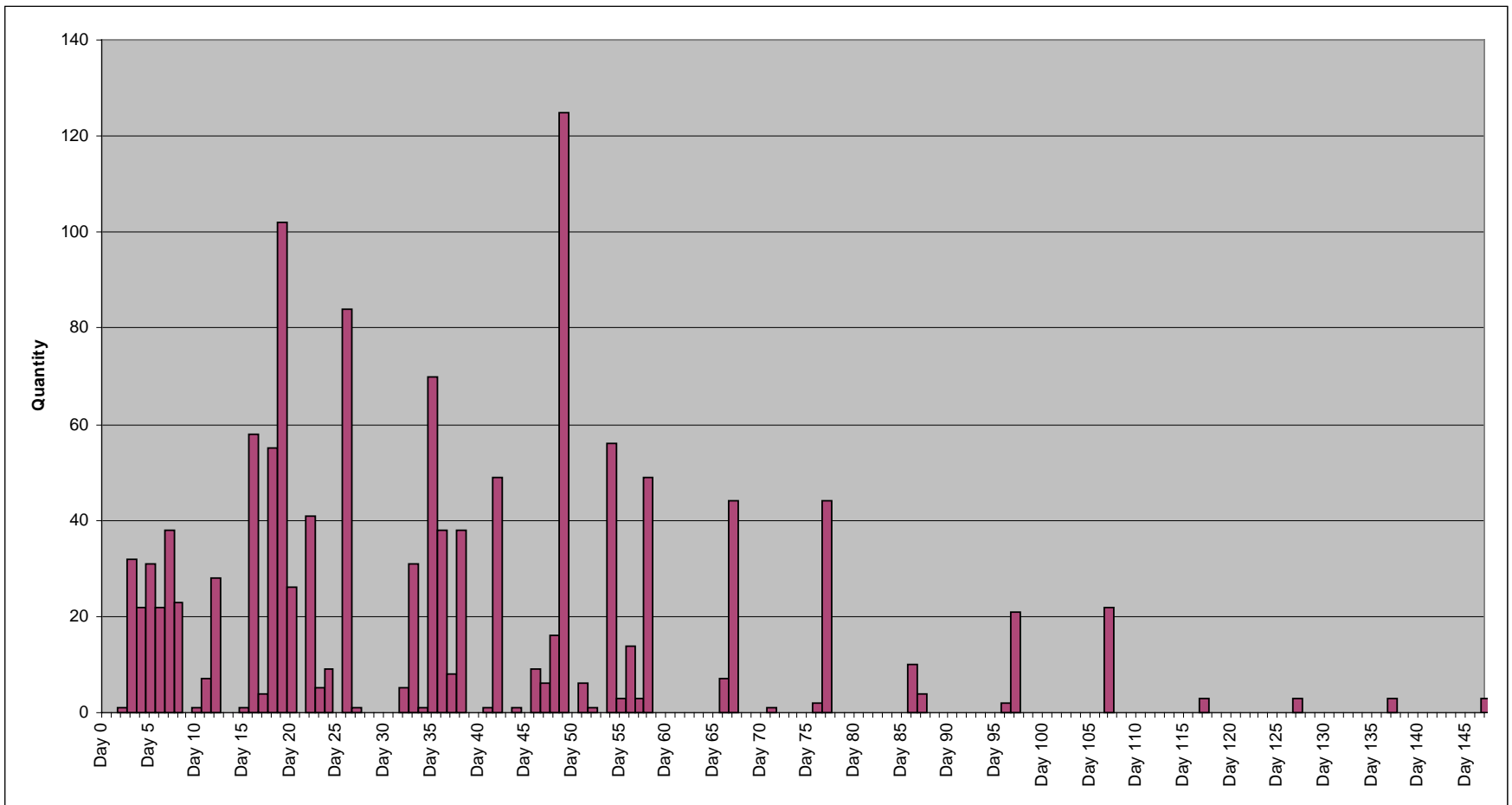
All cargo scheduled to arrive at NWS Concord will arrive by rail. NWS Concord has two categories of cargo scheduled to arrive in the TPFDD:

- 20-Foot Container Eligible Ammunition
- Container Outsize Cargo

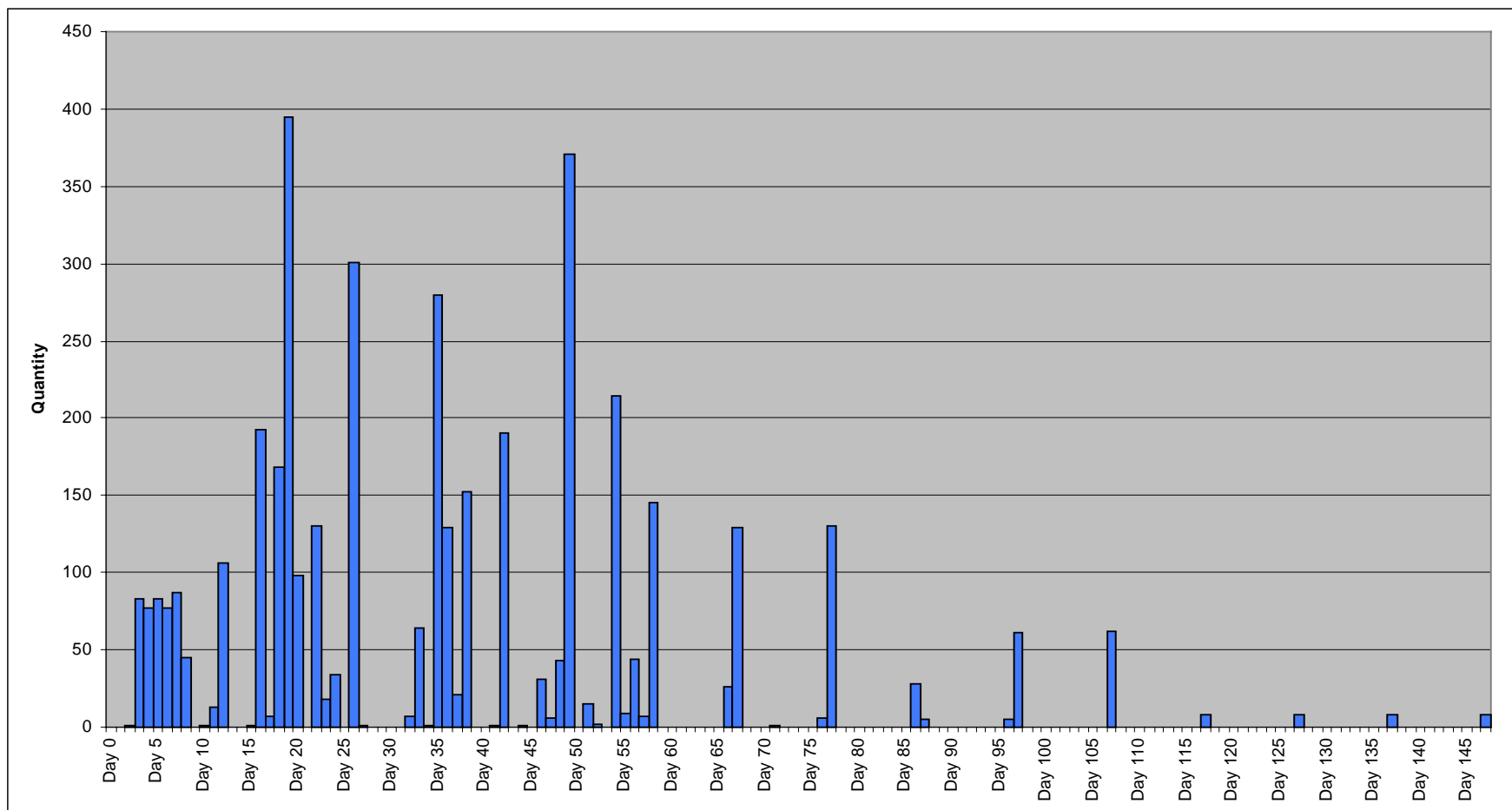
Figure 4 illustrates the quantity of 89-foot railcars arriving at NWS Concord each day.

The quantity of 20-foot containers arriving at the NWS Concord by day is shown in Figure 5.

Figure 6 represents the total square footage of cargo arriving at NWS Concord. It shows how much of the cargo is containerizable ammunition and how much is too large for a 20-foot container (container outsize). The container outsize cargo in figure 6 is 233 J143 rockets that are too wide to fit in a container. They originate at Concord, so it shouldn't be a real problem transporting to the port.

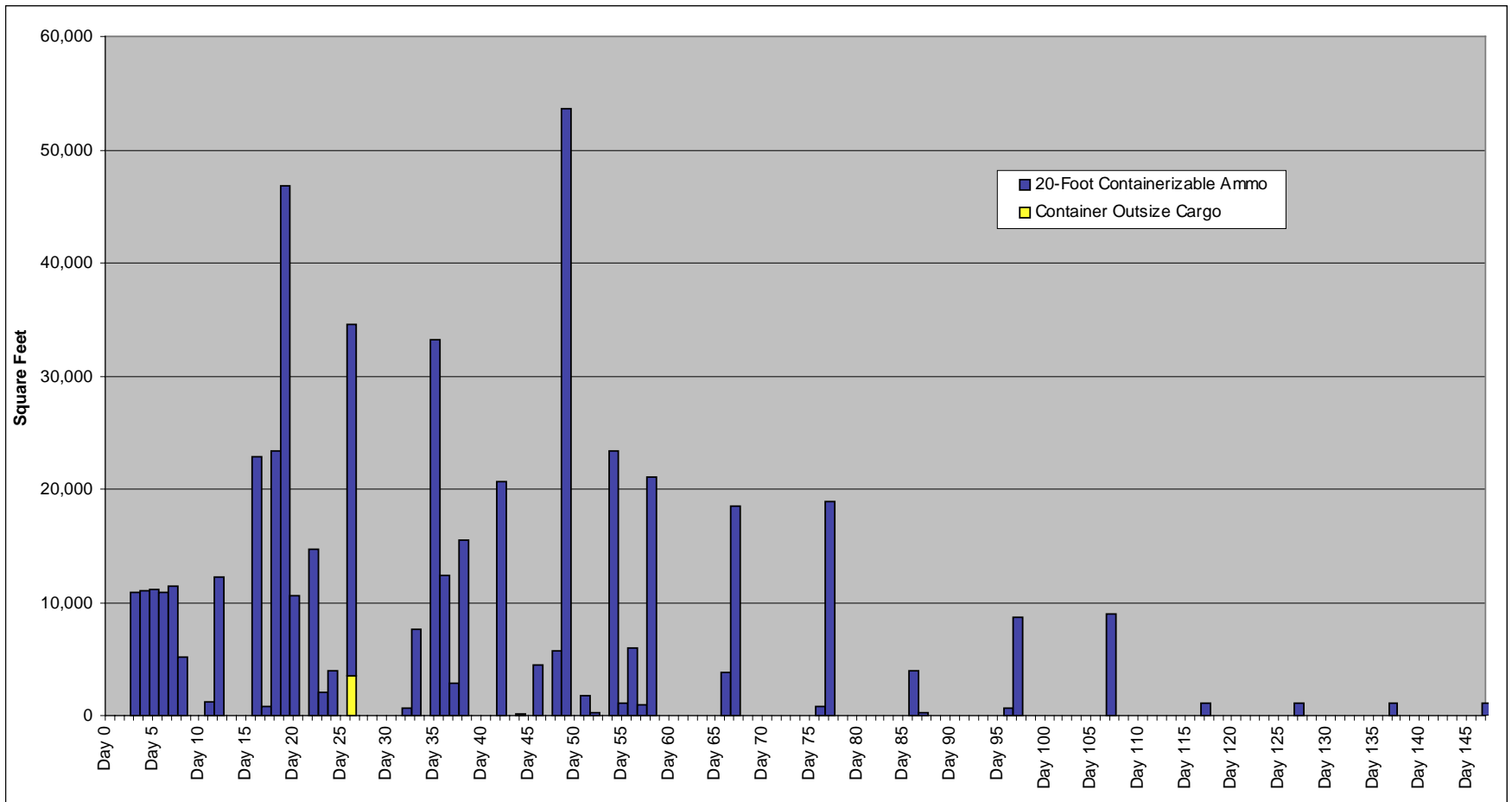


**Figure 4. Quantity of 89-Foot Railcars Arriving at NWS Concord.**



*Figure 5. Quantity of 20-Foot Containers Arriving at NWS Concord.*





**Figure 6. Total Square Feet of Cargo Arriving at NWS Concord.**

## **MILITARY OCEAN TERMINAL SUNNY POINT**

The graphs below represent the cargo arriving at the Military Ocean Terminal Sunny Point (MOTSU) as outlined in the TPFDD. Cargo arrives at the port starting on day -2 and continuing through day 73. All cargo scheduled to arrive at the Military Ocean Terminal Sunny Point will arrive by rail.

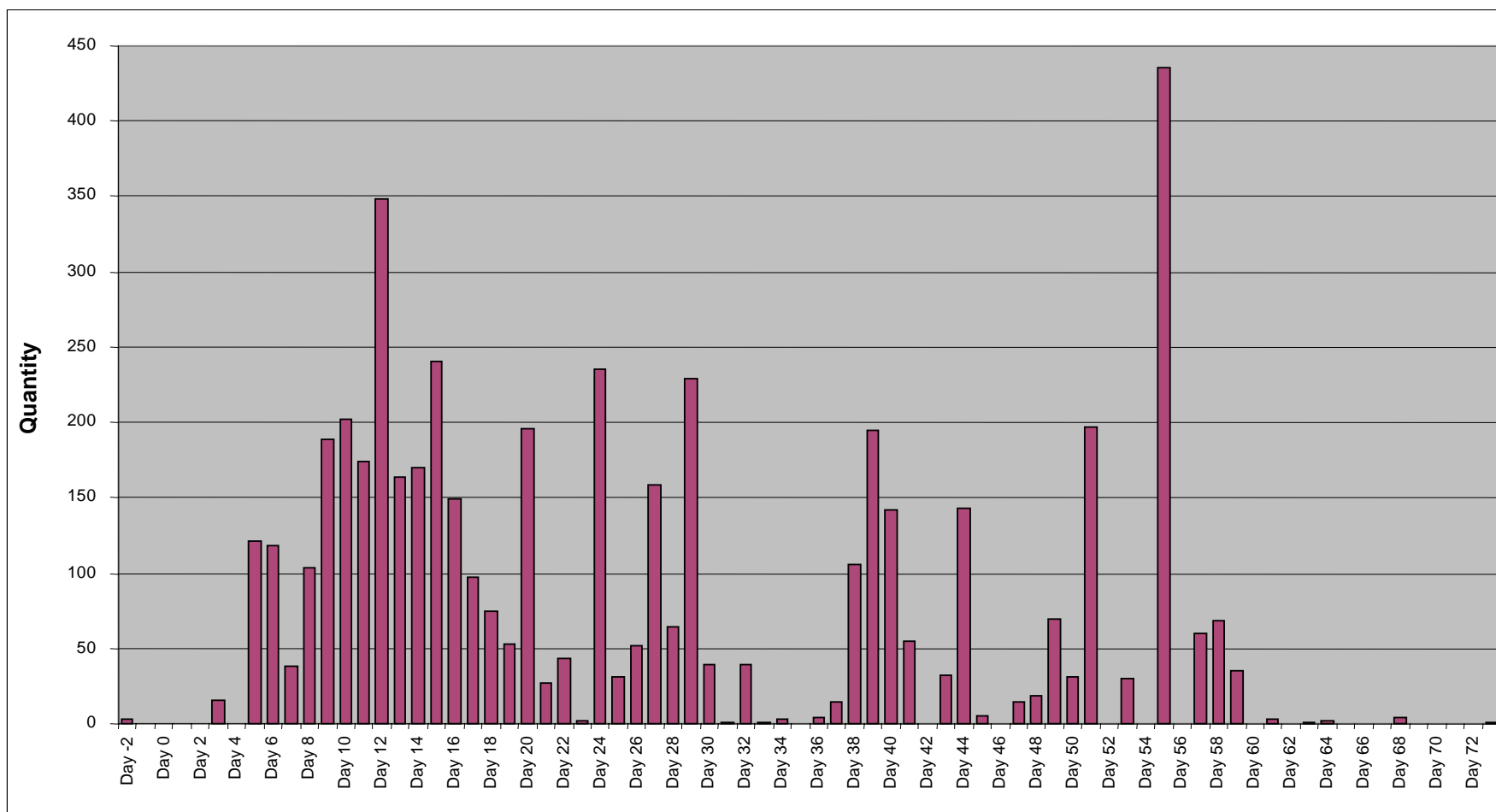
Sunny Point has three categories of cargo scheduled to arrive in the TPFDD:

- 20-Foot Container Eligible Ammunition
- Non-Containerized Cargo

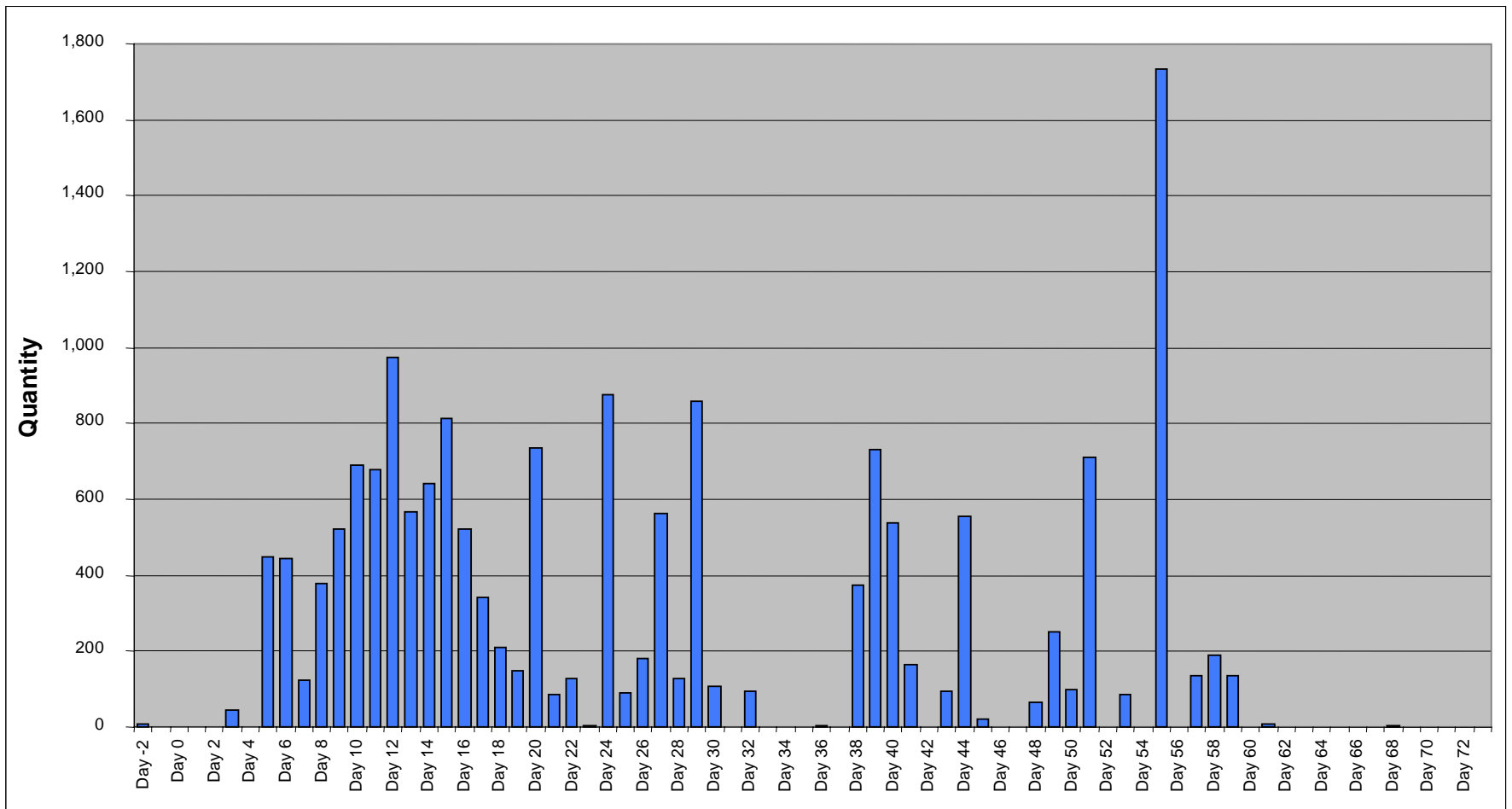
Figure 7 is the quantity of 89-foot railcars expected to arrive at Sunny Point each day.

Figure 8 displays the quantity of containers arriving at Sunny Point. The largest number of containers is scheduled to arrive at the port on day 55, with a total number of containers exceeding 1,700.

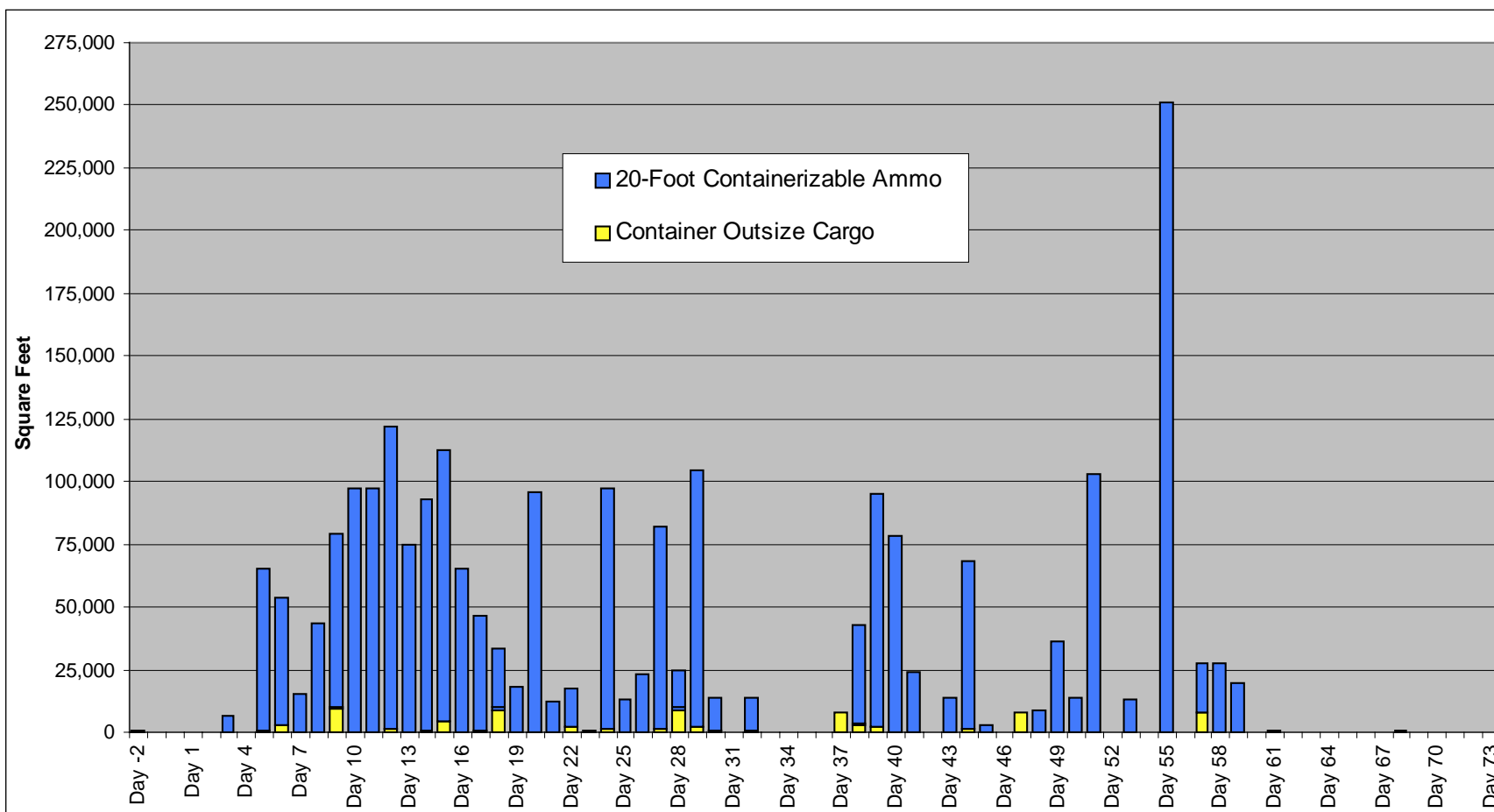
Figure 9 shows the total square footage of cargo arriving at Sunny Point. It shows how much of the cargo is containerizable and how much is not containerized. Figures 10 and 11 give the same information in more detail.



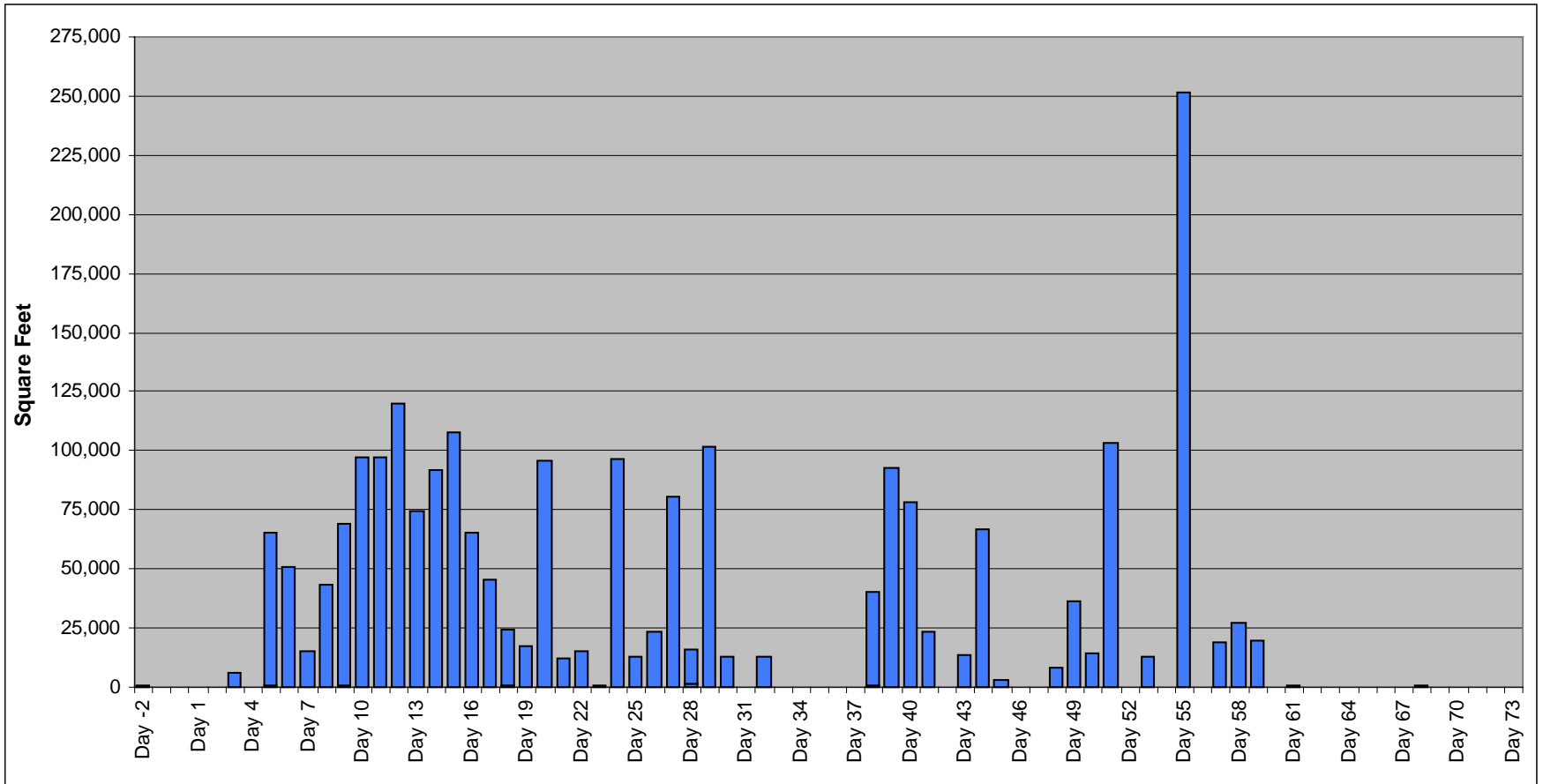
*Figure 7. Quantity of 89-Foot Railcars Arriving at Sunny Point.*



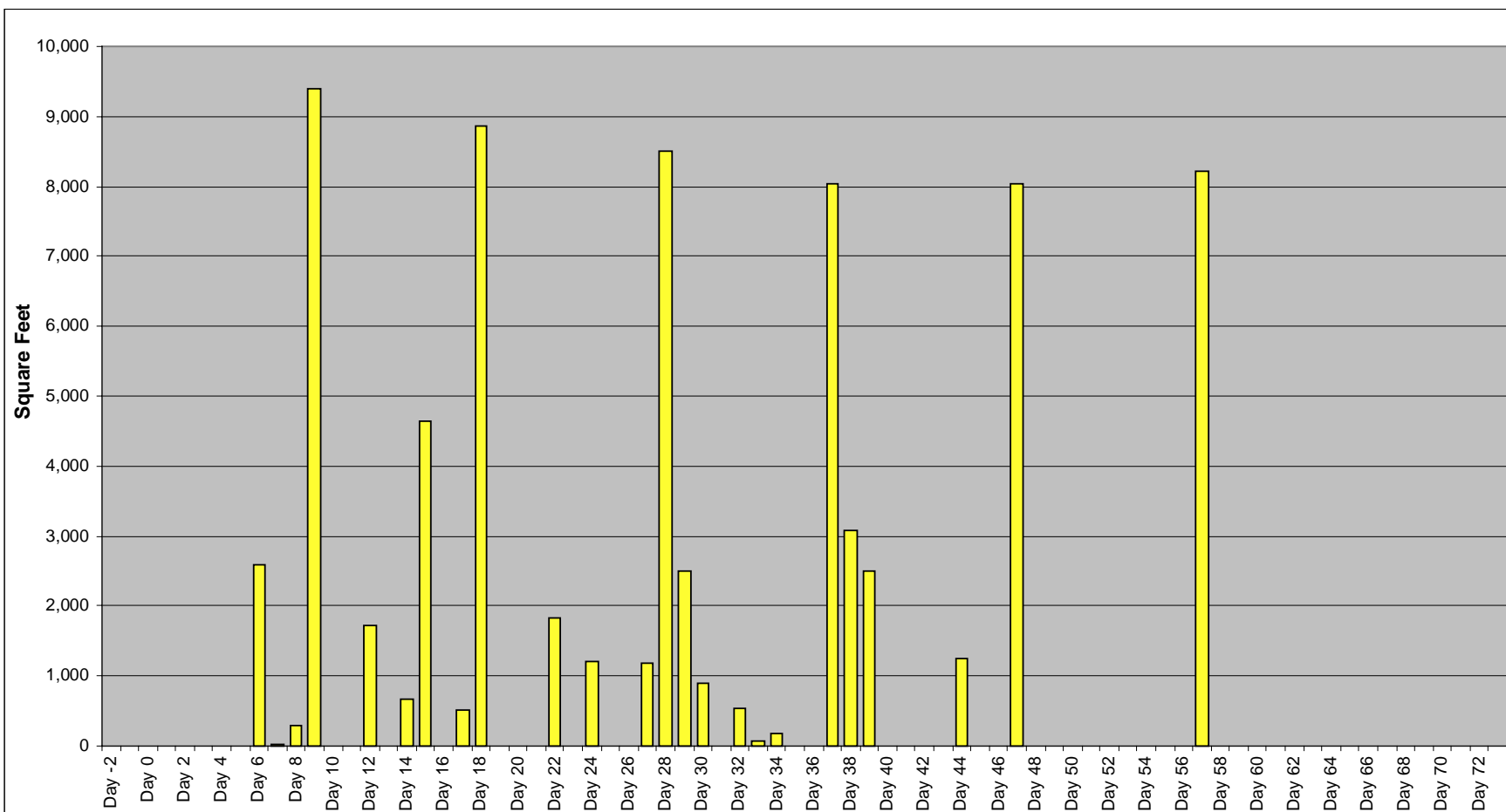
**Figure 8. Quantity of 20-Foot Containers Arriving at Sunny Point.**



**Figure 9. Total Square Feet of Cargo Arriving at Sunny Point.**



**Figure 10. Square Feet of Containerized Cargo Arriving at Sunny Point.**



**Figure 11. Square Feet of Non-Containerized Cargo Arriving at Sunny Point.**